DOCUMENT RESUME

ED 208 037 TM 810 734

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TITLE Examining the Effects of Incentives on the Return Rates of Mailed Surveys.
PUB DATE [77]
NOTE 30p.

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Data Collection; *Incentives; *Literature Reviews; *Responses; *Surveys
IDENTIFIERS Linear Tests; *Mail Surveys; *Response Rates (Questionnaires)

ABSTRACT

Although the mail survey is an efficient method for collecting data, its major disadvantage of nonresponse bias is reflected in the number of studies conducted investigating the effects of incentives to increase response rates. Linsky (1975) reviewed studies investigating the use of incentives to increase mailed return rates and found inconsistencies regarding the efficacy of various incentives. The present study used two different approaches in an attempt to resolve inconsistencies found among articles regarding the use of incentives to increase mailed survey response rates. It was hypothesized that a uniform method of analysis for all articles might resolve the reported inconsistencies. This possibility was examined as Experiment I. In addition, it was hypothesized that pooling data across studies by summing the number of returned and total number of survey questionnaires at each treatment level might also resolve the reported inconsistencies. This approach was examined as Experiment II. The results of each experiment are discussed and a summary of the findings is reported. (Author)

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Examining the Effects of Incentives on the Return Rates of Mailed Surveys

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Abstract

Although the mail survey is an efficient method for collecting data, its major disadvantage of nonresponse bias is reflected in the number of studies conducted investigating the effects of incentives to increase response rates. Linsky (1975) reviewed studies investigating the use of incentives to increase mailed return rates and found inconsistencies regarding the efficacy of various incentives. The present study used two different approaches in an attempt to resolve inconsistencies found among articles regarding the use of incentives to increase mailed survey response rates. It was hypothesized that a uniform method of analysis for all articles might resolve the reported inconsistencies. This possibility was examined as Experiment I. In addition, it was hypothesized that pooling data across studies by summing the number of returned and total number of survey questionnaires at each treatment level might also resolve the reported inconsistencies. This approach was examined as Experiment II. The results of each experiment are discussed and a summary of the findings is reported.

Examining the Effects of Incentives on the Return Rates of Mailed Surveys

The mail survey is an efficient method for collecting data and because a large number of subjects may be sampled, it offers a data collection method that may yield greater validity through more representative samples (Miller, 1970). However, survey methodology presents the researcher with some unique problems including nonresponse bias and response error. The major disadvantage of the mailed survey is that of nonresponse bias (Miller, 1970). This is reflected in the fact that most of the studies conducted on mailed survey methodology have investigated the effects of incentives to increase response rates.

Linsky (1975) reviewed studies investigating the use of incentives to increase mailed return rates. By tallying findings of each study as significant or nonsignificant, he found inconsistencies regarding the efficacy of various incentives. However, differing methods of analysis were employed in the original studies, and consequently, it is conceivable that the inconsistencies reported were due to the differing analyses rather than to any real differences inherent in the data across studies. It was hypothesized that comparing the tallied results from each article based on the results of a uniform method of analysis for all articles might resolve the reported inconsistencies. This possibility was examined as Experiment I entitled Voting

Method.

The voting method consists of tallying significant versus nonsignificant findings and deciding in favor of the decision outcome receiving the greatest number of tallies. Because Glass (1976) and Light and Smith (1971) have commented on the weak inferential value of this approach a pooling approach was also utilized. The pooling of data across studies was accomplished by summing the number of returned and total number of survey questionnaires at each treatment level. This approach was examined as Experiment II entitled Pooling Method.

Thus, the present study attempts to resolve inconsistencies found among articles regarding the use of incentives to increase mailed survey response rates by two different methods, the Voting and Pooling methods. The data for this study was collected by searching the literature of nine professional journals. The search began with the 1950 issues, but due to limited availability of several journals the years for which they were searched are listed after each journal:

Journal of Advertising Research, 1960-1980

Journal of American Statistical Association, 1950-1980

Journal of Applied Psychology, 1950-1980

Journal of Marketing, 1950-1980

Journal of Marketing Research, 1964-1980

Printer's Ink, 1950-1967

Social Forces, 1950-1980

Sociology and Social Research, 1950-1980

Vocational Guidance Quarterly, 1960-1980

These particular journals were selected due to their demonstrated commitment to publishing articles relevant to design and analysis issues in survey research. Studies were selected for inclusion where incentives were the independent variable and survey response rates were the dependent variable. To be selected for inclusion studies had to report the total number of subjects and the number and/or percentage of returned surveys. The rationale for these cirteria will become evident. Eighty studies meeting these criteria were originally located with 39 containing information appropriate for reanalysis. The 39 studies were organized in homogeneous clusters (Light & Smith, 1971). These incentive clusters were examined separately in Experiments I & II and are identified as postage, questionnaire color, personalization, preliminary contact, monetary, and follow-up mailings. These six incentive clusters investigated were used because they were the ones most frequently encountered in the literature and for which sufficient data were available.

Experiment I--Voting Method

Procedure

The uniform method of analysis selected was the linear trend and departure from linearity tests for proportional data (Snedecor & Cochran, 1967). The linear trend test was selected because when speaking of return rates it seems appropriate to speak in terms of increasing trends in the

data. Although most frequently used, Chi Square seems less appropriate because it is based on the idea that if the hypothesis upon which the expected frequencies are computed is correct, deviations of acutal frequecncies from the expected ones will be random fluctuations (Chase, 1967).

Table 1 is a summary of the articles that were tallied according to two voting methods. The first procedure listed under Original Analysis tallied the results as reported in the studies. Where analyses were not originally conducted an (X) appears in the appropriate column. The tallies listed under Uniform Analysis represents the voting method after reanalysis using the linear trend and departure from linearity tests.

Results

Postage Incentive Cluster. Both the postage employed on the exterior envelope and on the return envelope have been investigated with regard to their incentive value. Only those studies dealing with exterior postage are included in this analysis, due to the limited data on return postage variations. Eight of the original 80 studies located were found to contain data appropriate for reanalysis in this postage cluster.

Kernan (1971) concluded that neither a personalized address nor first class postage (as opposed to bulk rate postage) significantly affected response rates. However, Champion and Sear (1969) and Gullahorn and Gullahorn (1963) report significant increases for a regular stamp as compared

to metered postage. Vocino (1977) found no increase in response from a commemorative stamp as compared to metered postage. Kanuk and Berenson (1975) aptly conclude that these investigations have been conducted with inconsistent results.

Insert Table 1 About Here

Table 1 presents the results of both voting procedures for the postage data. All of the original investigations reported significance with the exception of the nonsignificance reported by Kernan (1971) (omitting Hensley, 1974 and Vocino, 1977 who did not conduct statistical tests appropriate to postage treatment levels). However, only Gullahorn and Gullahorn (1959) and Kephart and Bressler (1958) report data which demonstrate significant linear trends. It is interesting to note that the voting method via the original analysis suggest that type of postage increases response rates. Upon reanalysis by the uniform voting method there is reason to question the incentive value of differing types of postage. As can be seen from Table 1 none of the three studies with three or more levels demonstrated a departure from linearity, or a significant linear trend, suggesting that the trend of responses was best described by a straight line with no slope.

Questionnaire Color Incentive Cluster. The color of the paper on which mail survey questionnaires were printed has

been investigated as a factor influencing return rates. Four such articles were located in the literature search and provided the data for this cluster.

The few available research reports in this area present conflicting results (Linsky, 1975). Bender (1957) summarizes two related studies by saying that the color of questionnaire stationary was ineffective in stimulating survey returns. Matteson (1974), on the other hand, concluded that the color of the questionnaire may iprove the response rate significantly. In light of the contradictions found in this body of literature, a closer examination seems warranted.

Table 1 presents the tallies for both voting procedures. In the original analyses only one of the studies (Matteson, 1974) reached significance. The linear trend test yielded significant differences ($p<.05$) for Dunlap's (1950) data only. It is interesting to note that Gullahorn and Gullahorn (1963) and Matteson (1974) obtained indentical normal deviate scores ($Z=1.37$), but that Matteson originally reported significance and Gullahorn and Gullahorn did not. Both voting procedures question the efficacy of color as an incentive to survey responses.

Personalization Incentive Cluster. The level of personalization of the mail survey has frequently been investigated as an incentive to survey response rates. A number of different methods of introducing personalization have been investigated including handwritten as opposed to

typed elements, addressing the respondent by name, mimeographed as opposed to individually typed questionnaires, and real versus facsimile signatures. The most frequently encountered variation is a comparison of response rates to letters addressing the respondent by name (personal) as opposed to an impersonal salutation (e. g., Dear Student). The analysis is limited to studies comparing the personal salutation to the impersonal salutation, because only these treatment levels provided sufficient data for reanalysis.

Both Linsky (1975) and Kanuk and Berenson (1975) indicate that the evidence regarding personalization is highly inconclusive. Weilbacher and Walsh (1952) reject the hypothesis that personalization of letters of transmittal will positively affect the returns to a mail questionnaire. Dillman and Frey (1974) found that personalization not only increased response rates significantly in one study, but also increased the speed of subjects' responses in a second study. Because of the time and expense involved in personalization, such contradictory evidence is of practical concern. The test for departure from linearity was not conducted for this incentive cluster because only two treatment levels were involved.

Table 1 lists the six studies for both voting procedures. The table is reflective of the literature in general, that is, reflective of the inconsistency of findings reported. The uniform voting procedure offers no direction in resolving the inconsistencies, as the uniform

analyses are in line with the original analyses as reported.

Preliminary Contact Incentive Cluster. This incentive cluster consists of studies which investigate preliminary contact with respondents prior to their receiving the survey questionnaire. Kanuk and Berenson (1975) indicate that results of studies of preliminary contact have resulted in somewhat inconsistent results. Linsky (1975) reports, somewhat differently, that preliminary contact uniformly increased survey response rates. Six studies appropriate for reanalysis were located during the literature review and were included in this incentive cluster.

The results of both the uniform and original voting procedures are presented in Table 1. Again, the uniform analysis failed to alter the outcome of the voting procedure. In both cases five studies yielded significance and one yielded nonsignificance. The suggestion being that preliminary contact is an effective method of increasing survey response rates.

Monetary Incentive Cluster. This incentive cluster consists of eight studies investigating the use of monetary incentives enclosed with the mailed questionnaire. The use of monetary incentives has generally been found to increase survey response rates although Huck and Gleason (1974) concluded tha the monetary incentive must be combined with a follow-up in order to achieve an acceptable response rate. As shown in Table 1 both the uniform and original voting procedures appear to increase survey response rates. No

evidence of inconsistent findings exists in the monetary incentive cluster. Based on the consistently significant linear trend, and on the nonsignificant departure from linearity, one might conclude that as the monetary value of the incentive increases so does the survey return rate.

Follow-up Mailing Incentive Cluster. One of the most frequently applied methods for stimulating survey response rates is the follow-up mailing, consisting of a reminder to respondents regarding the completion of the questionnaire and its return. The follow-up procedure has been reported in many forms, such as by mail, telephone, and personal contact. The cluster is an analysis of only those studies using mailing as a form of follow-up. Seven such studies of the original 80 articles were found to report data appropriate for this cluster.

Linsky (1975) states that the follow-up technique has experienced great success. Kanuk and Berenson (1975) suggest that the real question with regard to follow-ups is the number of follow-ups that should be employed since follow-ups have been uniformly found to increase the number of returns.

The dependent variable to be used for the analyses changed from simple percentages of returns to cumulative percentges of returns. This was necessary because follow-up procedures are used only with subjects who initially failed to return questionnaires. No departure from linearity was performed because of the cumulative nature of the data.

Table 1 presents the results of both voting procedures for the follow-up studies. Each of the three studies reporting formal analyses in the original investigation were significant. The linear trend test for all studies was also significant. It would appear that the follow-up technique is effective based on both voting procedures.

Experiment II--Pooling Method

Procedure

For the purpose of analysis by the linear trend and departure from linearity tests, the treatment levels were arranged in ascending order based on their expected incentive value. It was assumed that the treatment levels represented gradations of amounts of incentives on a continuous scale. Weights were assigned to treatment levels (as required by the statistical tests) by level of expected incentive value to the respondent. Moderate objections to the assigned weights should not produce marked differences in the conclusions drawn from the analysis according to Snedecor and Cochran (1967). Therefore, the weights are not reported here. The contention remains that as incentives were increased the proportion of respondents in each treatment level should have also increased.

The data was then pooled at each treatment level and the pooled data was tested for linearity and departure from linearity. As stated before, the pooling of data across studies was accomplished by summing the number of returned and total number of survey questionnaires at each treatment

level. To control for the effects of differing sample sizes the number of total subjects for each study was set equal to 100 and the percentage of subjects responding was substituted for the number of returned responses. This, in effect, weighted each study equally regardless of the original sample size.

An implicit assumption of combining the pooling procedure and the tests for linear trend and departure from linearity is that each study be represented at each treatment level. This assumption was met and tests were conducted for the personalization and follow-up incentive clusters. However, the valididty of the linear trend and departure from linearity test results are subject to distortion for the monetary, postage, and preliminary contact incentive clusters because not all studies were represented at each treatment level. For example, as shown in Figure 1, there is fairly equal representation of studies at the control and letter treatment levels, but not at the postcard and telephone treatment levels for the preliminary contact incentive cluster. This lack of equal representation may require futher investigation of these particular levels. The tests are not reported for the questionnaire color incentive cluster because there was extensive violation of the assumption of equal representation.

Insert Figure 1 About Here

Results

Personalization. The data across all six studies were pooled for both treatment levels (form and personal letter). The pooled procedure yielded nonsignificance ($Z=1.62$, $p>.05$). Figure 2 illustrates the slope of the pooled data that is not significantly different from zero. Because two points define a straight line, the departure from linearity test was not conducted.

Insert Figure 2 About Here

Each study that was pooled may be examined by drawing a line between treatment levels in Figure 2. Doing so demonstrates why the voting procedures question the conclusion that personalization in uniformly ineffective as a survey incentive. However, the pooled analysis indicates that on the whole the added time and expense required for personalization are not justified by any uniformly significant increase in survey response rates.

Follow-up. The data from the seven follow-up studies were pooled across studies for reanalysis. As in the voting method the dependent variable used for the analysis changed from simple percentages of returns to cumulative percentages of returns. Again, this was necessary because follow-up procedures are used only with subjects who initially failed to return questionnaires.

This linear trend test performed for the data pooled

across studies yielded a significant linear trend ($Z=12.03$, $p<.01$) across the four treatment levels analyzed in order of their incentive value (no treatment control, first follow-up, second follow-up, and third follow-up). This means that each successive follow-up yielded diminishingly greater returns. That is, the first follow-up achieved 19% additional returns; the second follow-up yielded 15% additional returns; the third follow-up reminder achieved 7% additional returns. The data are not presented figuratively because each study reflected the same trend as indicated by both the pooling and the voting methods.

It is apparent from the data that the follow-up procedure is an effective incentive to increase survey response rates. The number of follow-ups suggested for a particular purpose should be decided based on desired outcomes and available resources. Based on our reanalysis we conclude that more than three follow-ups would rarely, if ever, be of any significant benefit.

Preliminary Contact. Four treatment levels were encountered in the six studies including a no treatment control, preliminary contact by postcard, preliminary contact by letter, and preliminary contact by telephone. The treatment levels were arranged in this order based on their expected incentive value.

Figure 1 reports the percentage of returns for each treatment level. The linear trend observed is significant ($Z=7.50$, $p<.01$). Also, the departure from linearity was

found to be significant (X^2_{diff} (2)=11.92, p<.01). These results indicate that preliminary contact is an effective method of increasing survey response rates, and that the postcard and letter are nearly equivalent in increasing response rates.

Because the studies are fairly equally represented at the control and letter treatment levels there is some justification for concluding that preliminary contact in the form of a letter increases the return rate over no preliminary contact at all. With less certainty we note that a postcard is as effective as a letter but both are less effective than preliminary contact by phone.

Postage. Six postage treatment levels were found in the eight studies and included: metered postage (third class), regular stamp (first class), commemorative stamp, multiple stamps, airmail, and special delivery. Although not all studies were represented at each treatment level, the six treatment levels were weighted in the above order.

Upon pooling the data across studies, a significant linear trend (Z=5.50, p<.001) was obtained. Further, the pooled data demonstrates a significant departure from linearity (X^2_{diff} (4)=20.05, p<.001). The studies are equally represented at the metered and regular stamp treatment levels. Regular stamps slightly increased the return rates over metered postage, however, there were no significant differences in return rates for metered, regular and commenorative postage. Although these results need to be

interpreted with caution, the lowest return rate is demonstrated when multiple stamps are used, with a sharp increase in return rates for airmail and special delivery postage.

Monetary. The eight studies in this cluster were grouped by level of monetary incentive. Seven treatment levels were used: $.00 (no treatment control group), $.01, $.05, $.10, $.25, $.50, $1.00.

When the data across all eight studies were pooled, a significant linear trend ($Z=3.87$, $p<.001$) was obtained. The pooled data also yielded a significant departure from linearity ($X^2_{diff}(5)=94.29$, $p<.001$).

These findings present a problem that is brought on by the violations of the equal representation assumption mentioned earlier. No money appears to be more effective than a $.50 or $1.00 incentive with the $.25 being most effective. However, because $.50 and $1.00 are not equally represented by all the studies (see Figure 3) such a conclusion may be erroneous. Upon examination of the two studies at the $1.00 treatment level (Blumberg, et al., 1974; Erdos, 1957) it appears that the $1.00 incentive is increasing in a linear fashion appearing less effective than $.25 because the return rate for all treatment levels in the Blumberg, et al. (1974) and Erdos (1957) studies were so depressed initially compared to the others.

Insert Figure 3 About Here

Discussion

The Uniform Voting Method used in Experiment I did little to resolve reported inconsistencies, suggesting as Glass (1976) and Light and Smith (1971) did that the voting procedure itself is of little inferential value. The value of the voting method was limited to its utility in organizing, describing and discussing the original investigations. A major limitation of Experiment II was that studies were not represented at all possible treatment levels in the incentive clusters. Consequently, at different treatment levels within the analyses, variance was attributable to different combinations of studies. However, both experiments revealed several interesting relationships within incentive clusters. The critical points are summarized for each incentive cluster as follows:

1. Follow-up incentive cluster. Follow-ups are without a doubt effective in increasing response rates. They were found to yield decreasingly fewer returns to the third follow-up. The evidence suggests that a fourth follow-up would be rarely warranted.

2. Preliminary Contact Incentive Cluster. It seems reasonable to expect higher return rates to a survey if the respondent's cooperation has been requested prior to receiving the survey instrument. Perhaps the preliminary contact serves as an incen-

tive to respond in the same manner as a follow-up mailing. Although not unequivocally suggested by the pooling procedure, receiving a commitment to respond by telephone would most clearly insure a response. Either a preliminary postcard or letter are suggested when the preliminary telephone call is too expensive or otherwise impractical.

3. Personalization Incentive Cluster. A personal salutation was found to offer no significant advantage to response rates when compared with an impersonal salutation. Perhaps the survey researcher would do well to invest the extra time and expense on an additional mailing, rather than on personalization.

4. Postage Incentive Cluster. Third class postage is as effective as a regular stamp, a commemorative stamp, or multiple stamps, but at the same time is less expensive. Because airmail and special delivery were not well represented by those studies including the other treatment levels, we recommend not concluding that they yield greater returns than other postage types.

5. Monetary Incentive Cluster. That $.25 had a higher response rate than $.50 or $1.00 is believed to be a function of the violation of the assumption of equal representation. However, whether survey response rates increase with increasing monetary

incentives remains to be demonstrated.

6. Questionnaire Color Incentive Cluster. The evidence obtained from both voting methods suggests that the effect of questionnaire color is not well understood. This problem stems from the fact that six of the seven different colors that have been examined were addressed in only one study. Therefore the exigencies of a particular sample at a particular treatment level are not moderated by other samples from other studies. We recommend using white paper (or the least expensive) until more is known.

There is little doubt that the mail survey will continue to be a major methodology in social and behavioral research. It is the responsibility of researchers to begin examining the use of incentives in mailed surveys to decrease the threat to validity created by nonresponse bias. Further studies of incentive variations, such as the ones reviewed, should attend to the effects of treatment combinations and conditions which maximize response rates with specific populations and for specific purposes.

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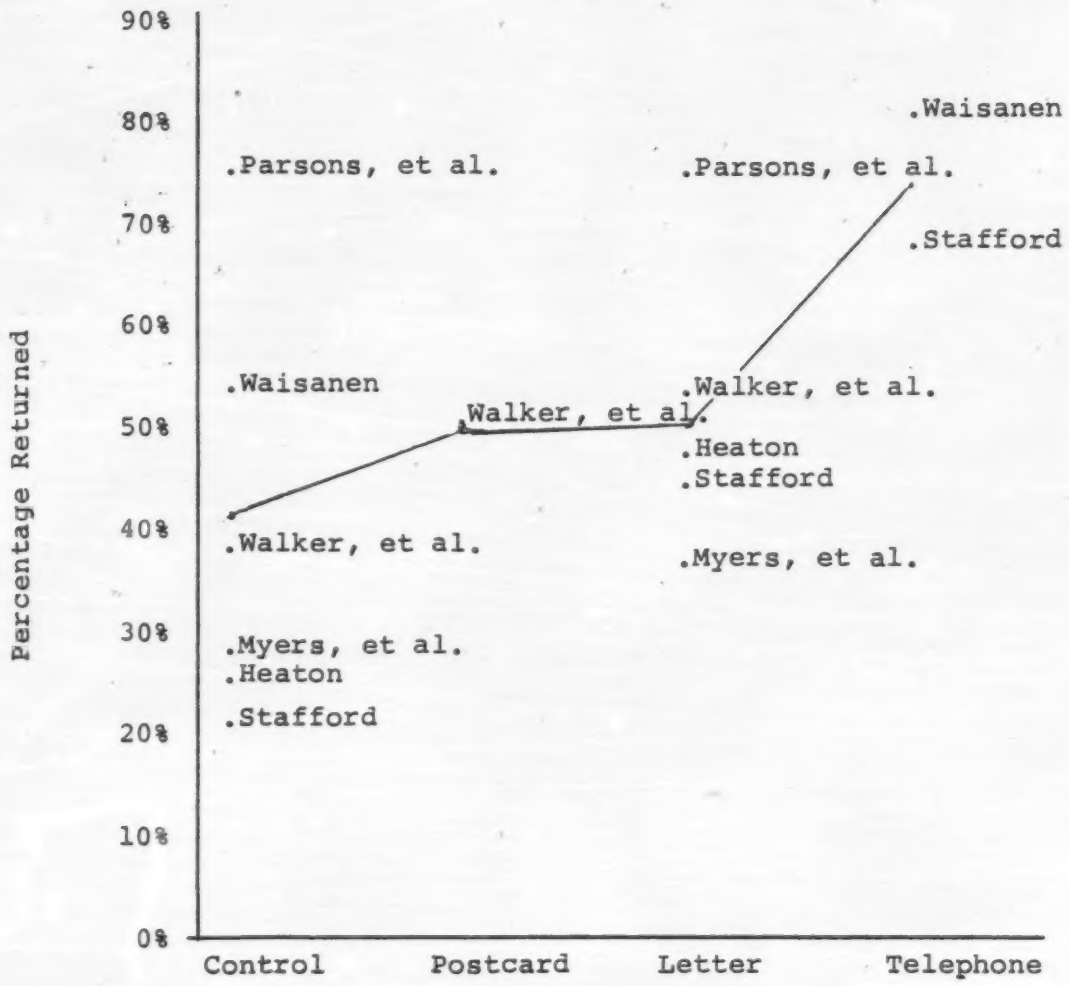
Table 1

Tallies for the Original and Uniform Voting Methods
Reported by Incentive Cluster

Studies	Original Analysis						Uniform Analysis	
	Not Specified	Not Conducted	Chi Square	z	Significance p<.05	Significance p>.05	Linear Trend (Z)	Departure From Linearity (X^2diff)
Postage Cluster								
Kernan (1971)			X			X	.52	
Gullahorn & Gullahorn (1959)			X		X		3.55**	
Hensley (1974)		X					-.28	.11 (1df)
Vocino (1977)		X					-.58	
Champion & Sear (1969)	X				X		.92	
Gullahorn & Gullahorn (1959)			X		X		1.62	
Kephart & Bressler (1958)	X				X		2.02*	.03 (1df)
Watson (1965)	X				X		1.18	3.85 (2df)
Questionnaire Color Cluster								
Gullahorn & Gullahorn (1963)			X			X	1.37	
Matteson (1974)	X				X		1.37	
Bender (1957)			X			X	.22	
Dunlap (1950)		X					2.00*	1.14 (2df)
Personalization Cluster								
Weilbacher & Walsh (1952)		X					-.82	
Cox, Anderson, & Fulcher (1974)			X		X		5.86**	
Dillman & Frey (1974)			X		X		2.88**	
Anderson (1970)	X					X	-.72	
Simon (1966)		X					1.16	
Linsky (1965)				X	X		2.62**	
Preliminary Contact Cluster								
Parsons & Medford (1972)	X					X	.11	
Myers & Haug (1969)			X		X		2.25*	
Stafford (1966)			X		X		12.78**	.05 (1df)
Walker & Burdick (1977)			X		X		3.42**	1.25 (1df)
Waisanen (1954)			X		X		3.47**	
Heaton (1965)			X		X		2.05*	
Monetary Cluster								
Kephart & Bressler (1958)	X				X		2.43*	2.49 (3df)
Erdos (1957)		X					6.36**	.13 (1df)
Huck & Gleason (1974)			X		X		3.46**	
Blumberg, Fuller & Hare (1974)			X		X		3.07**	
Goodstadt, Clung, Kronitz, & Cook (1977)			X		X		4.70**	
Maloney (1954)		X					3.25**	
Kimball (1961)	X				X		5.13**	
Gelb (1975)		X						
Follow-up Mailing Cluster								
Levine & Gordon (1958)		X					4.23**	
Bachrack & Scoble (1967)		X					13.45**	
Donald (1960)		X					24.78**	
Kephart & Bressler (1958)	X				X		2.31*	
Etzel & Walker (1974)			X		X		4.43**	
Hinrichs (1975)	X				X		24.83**	
Watson (1965)		X					5.21**	

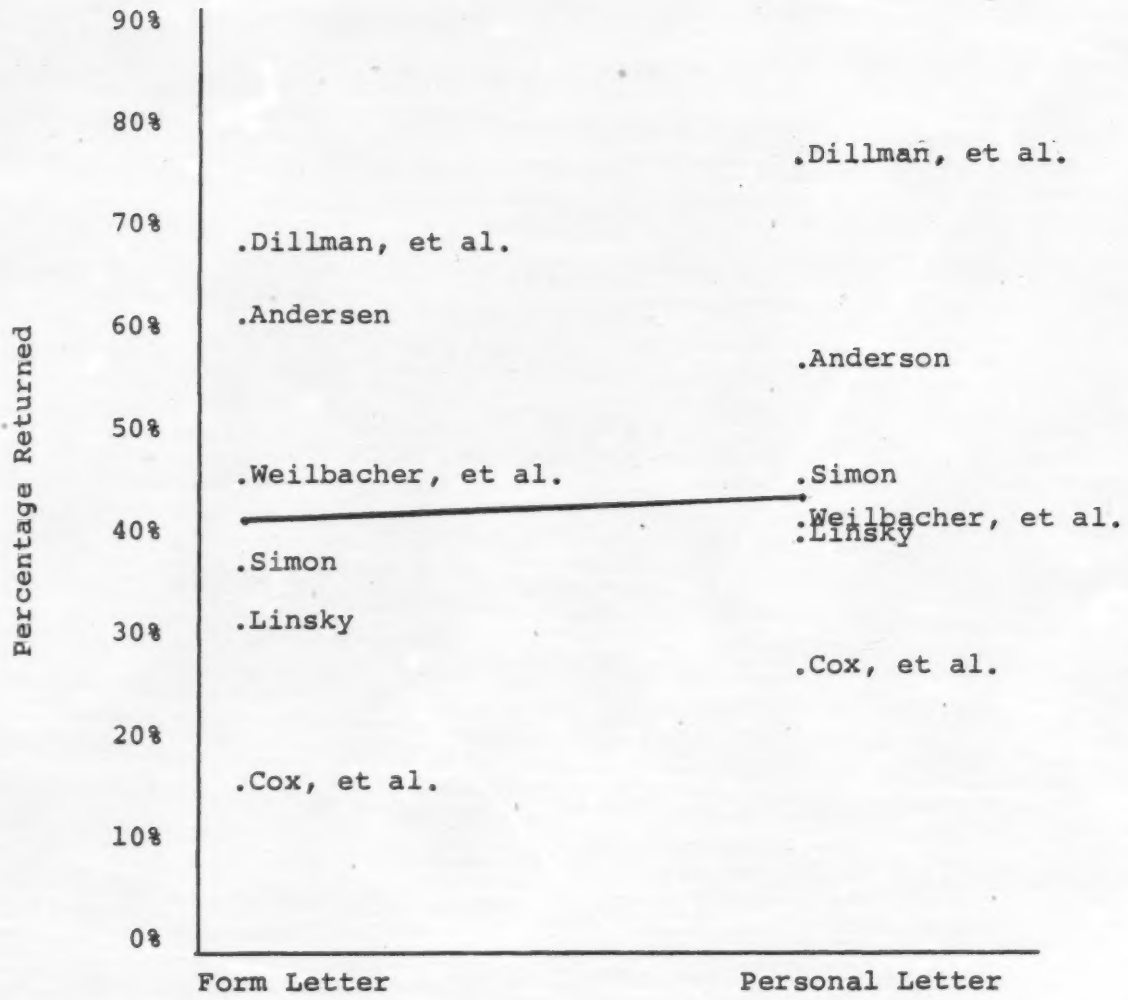
*(p<.05
**(p<.01)

Figure 1
Pooled Data by Treatment Levels
For Preliminary Contact Cluster



($z=7.50$, $p<.01$)
($\chi^2_{diff}(2)=11.92$, $p<.01$)

Figure 2
Pooled Data by Treatment Levels
For Follow-up Mailing Cluster

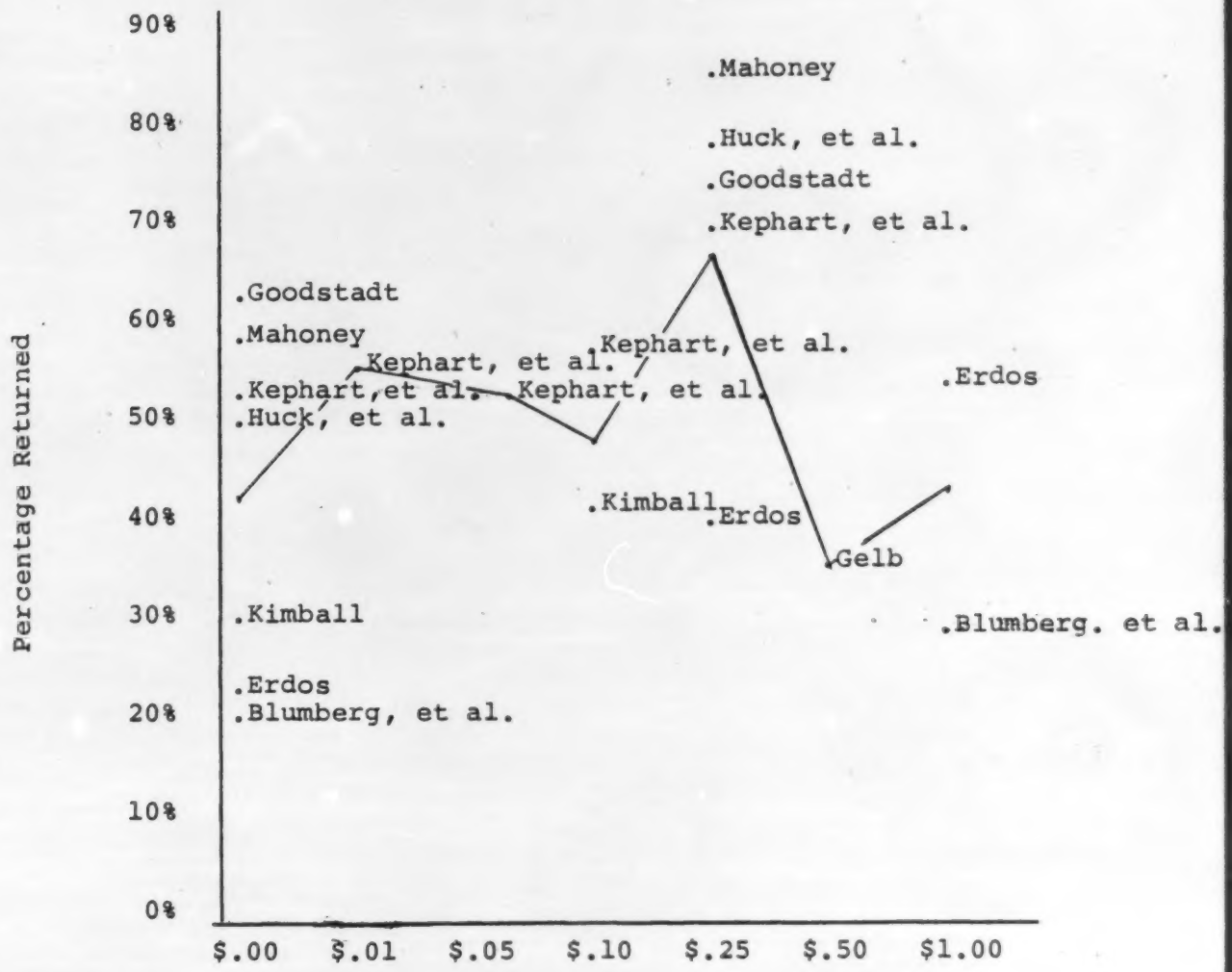


(Z=1.62, p>.05)

Figure 3

Pooled Data by Treatment Levels

For Monetary Incentive Cluster



(Z=3.88, p<.001)

($X^2_{diff}(5)=94.29$, p<.001)